

X-RAY RADIOGRAPHY SYSTEM

2/3
Annexure-C

Sr. #	Specification/Description of Items	Qty Required	Remarks
01	<p><u>X-Ray Radiography System</u></p> <p>1. Purpose: For radiographic examination of different types of weldings and materials.</p> <p>2. Technical Data/Specifications:</p> <p>2.1 Tube Voltage Range: 5 – 320 KV 2.2 Adjustment Increments (minimum): ≤ 0.1 KV 2.3 Accuracy: $\pm 1\%$ of max. KV 2.4 Emission Current Range: 0 – 15 mA 2.5 Adjustment Increments: ≤ 0.1 mA 2.6 Accuracy: $\pm 0.2\%$ of max. mA 2.7 Exposure Time Range: 0.1 – 99.9 minutes 2.8 Adjustment Increments: ≤ 0.1 minute 2.9 Focal Spot Size (EN 12543): 1.0/3.0 mm 2.10 Duty Cycle: 100%</p> <p>3. Cooling System</p> <p>3.1 Primary Cooling: Oil/gas cooling system with adjustable flow rate and safety devices 3.2 Secondary Cooling: Water cooling system</p> <p>4. Safety Features:</p> <p>4.1 Emergency stop 4.2 Over load protection</p> <p>5. Operating Conditions</p> <p>5.1 Temperature Range: 10 – 40 °C 5.2 Relative Humidity: 20 – 80 % 5.3 Electrical Supply: 400/220 V $\pm 10\%$, 50 Hz</p> <p>6. Essential Components of System</p> <p>6.1 Bipolar tube 6.2 High Voltage Generator, 160KV (Anode) 6.3 High Voltage Generator, 160KV (Cathode) 6.4 Control Module 6.5 Oil Cooling Pump with closed circuit oil cooling and flow rate monitor</p> <p>7. Standard Accessories:</p> <p>7.1 High Voltage Cables, 160 KV: 20m long (02 no.) 7.2 Connecting Cable 20m long 7.3 Pair of Cooling Oil Hoses 7.4 Pair of Water Hoses 7.5 Warning Flash Lamp with 20m cable and "Fail-safe" circuit & tripod stand for lamp 7.6 Warning Blinker Lamp with cable 7.7 Column Stand 7.8 Four Legged Stand 7.9 Remote control panel 7.10 Collimator to reduce x-ray scatter radiation 7.11 Laser Centering Device 7.12 Diaphragm 7.13 Shutter unit with two position (open & close)/Lead plug for X-ray tube window 7.14 Exposure Calculator (PC Software) 7.15 Emergency Stop Button (Mushroom push button with 10m cable) 7.16 Alarm Box (Safety Device) 7.17 Tool Kit/Service kit</p> <p>8. Spares for 10 Years Operation Essential spares for 10 years operation including cooling oil, fuses, resistors, set of connectors, switches, bulbs, protection relays, filters, seals, power cables, control cable and any other spares which are essential for Operation/Maintenance may be quoted.</p> <p>9. IQI (Image Quality Indicator)</p> <p>9.1 Hole type, Material SS 3 steps/levels, each of 10 x 10 (mm)</p>	01 Complete Unit	

Am-Z

	<p>Step thickness/Hole dia.: 0.25, 0.30 & 0.40 (mm) 2 same diameter diagonal holes on each step</p> <p>9.2 IQI will be fabricated according to given drawing and provided along with product quality certificate.</p> <p>10. Documentation: All documents including certificates, operating manuals, troubleshooting & maintenance manuals, electrical & control circuit diagrams, exposure charts and IQI quality certificates will be provided in English.</p>		
02	<p><u>Automatic Film Processing Unit</u></p> <p>1. Purpose: For automatic processing of radiographic films.</p> <p>2. Technical Data/Specifications:</p> <p>2.1 Capacity: Minimum 30 Films/Hour of 35 x 43 cm at standard processing cycle</p> <p>2.2 Film Type: All types of industrial radiographic films like AGFA (D2, D3, D4, D5, D7 & D8), KODAK and FUJI</p> <p>2.3 Processing Time/Cycle: 3 – 12 minutes</p> <p>2.4 Transport Speed: 20 – 50 cm/min.</p> <p>3. Film Sizes:</p> <p>3.1 Width Minimum: ≤ 3.5 cm</p> <p>3.2 Width Maximum: 43 cm</p> <p>3.3 Length Minimum: ≤ 12 cm</p> <p>3.4 Length Maximum: ≥ 48 cm</p> <p>4. Processing Parameters:</p> <p>4.1 Developer Temperature (adjustable): 20 – 34 °C</p> <p>4.2 Fixer temperature: Adjusted to developer temperature by heat exchanger</p> <p>4.3 Dryer Temperature: Auto/manually adjustable between ambient and 65 °C (or infrared drying)</p> <p>4.4 Developer Immersion Time: 100 sec.</p> <p>5. Control Features:</p> <p>5.1 Automatic Start-Stop-System with integrated Stand-by-Function</p> <p>5.2 Microprocessor controlled control panel with digital display</p> <p>5.3 Automatic tank filling</p> <p>5.4 Automatic replenishment system by film surface scanning</p> <p>5.5 Processing temperature calibration setting</p> <p>5.6 Emergency stop and necessary safety features</p> <p>6. Tank Capacities</p> <p>6.1 Developer Tank: 8 – 10 Liters</p> <p>6.2 Fixer Tank: 8 – 10 Liters</p> <p>6.3 Final wash Tank: 8 – 10 Liters</p> <p>7. Operating Conditions</p> <p>7.1 Temperature Range: 10 – 40 °C</p> <p>7.2 Relative Humidity: 20 – 80 %</p> <p>7.3 Electrical Supply: 400/220 V \pm 10%, 50 Hz</p> <p>8. Essential Components of System</p> <p>8.1 Automatic Film Processor</p> <p>8.2 Light-tight Cover</p> <p>9. Standard Accessories:</p> <p>9.1 Chemical Mixing Tanks (graduated)</p> <p>9.2 Chemical Replenishment Tanks</p> <p>9.3 Outlet, Overflow and replenishment hoses (color coded) for water, developer and fixer chemicals.</p> <p>9.4 Water filter with cartridge</p> <p>9.5 Base/Table Stand (if required)</p> <p>9.6 Digital thermometer for temperature calibration (if available)</p> <p>10. Spares for 05 Years Operation For 05 operation and maintenance, supplier may provide the list of essential spare parts.</p> <p>11. Documentation All documents including certificates, operating manuals, troubleshooting & maintenance manuals, electrical & control circuit diagrams will be provided in English.</p>	01 Complete Unit	